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**ADKNOWLEDGEMENT**

This 1987 Downtown Pedestrian Study largely replicates the 1981 Downtown Pedestrian Study. It has been prepared as part of an on-going monitoring process for downtown Halifax. The project was organized and supervised by Simpson McLeod and John Heseltine of the Planning Division of the Development and Planning Department, who also took the same roles in the preceding study. Pedestrian counting as done by Philip Fraser and Peter Nijssen, who were employed by the Planning Division during the summer of 1987. Processing of data was done by Mr. Nijssen with the assistance of Mr. Fraser. We also gratefully acknowledge additional work done by Mr. Nijssen at the Technical University of Nova Scotia that has been incorporated in this report.

R. J. Matthews
Director of Development
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Development and Planning Department
March, 1988

## EXECUTIVE SUMMARY

- The 1987 Pedestrian Study consists of day-long counts of the number of pedestrians at major downtown intersections and factored counts of pedestrians passing all mid-block points in the downtown area.

- Counts were done in May and June on weekdays between 8:00 a.m. and 6:00 p.m. when weather was fair.

- Day-long counts taken at the busiest intersections in subareas of the downtown showed three peak periods: the early morning from 8:00 to 9:00 when workers arrive at shops and offices; the lunch period from noon to 2:00 p.m.; the afternoon from 4:00 to 5:00 p.m. when workers leave for home.

- The total pedestrian volume estimated showed an increase of 2.65 percent per year between 1981, when the last pedestrian study was done and 1987. This is a much more moderate rate than the 6.27 percent growth between the first pedestrian study in 1978 and the 1981 counts.

- The most travelled pedestrian routes continue to be Spring Garden Road and Barrington Street.

- Further major pedestrian arteries are Duke from Historic Properties to Scotia Square and George Street from the Ferry Terminal to Barrington Street. These routes together with Duke and Barrington join major areas of the downtown where people disembark from vehicles (buses, cars and ferries). They also tend to include streets with shallower inclines than alternative streets.

- Changes on specific blocks between 1981 and 1987 are generally attributable to attractive new developments where increases are evident and to construction underway during the survey period where there are substantial decreases.

- Argyle Street has continued to increase its importance as a substitute for Barrington Street carrying pedestrians between Spring Garden Road and Scotia Square. Because it has many attractive restaurants, pubs, and specialty stores, it is especially favoured by tourists. Other streets around Argyle also showed increases attributable to through traffic and new construction such as the Prince George Hotel.

- The core portion of Barrington Street has shown moderate declines.

- Waterfront streets have generally shown substantial increases as a result of a number of new developments there and overall improvements such as the waterfront boardwalk.

- Counts around Scotia Square generally dropped.

- The pedways from Scotia Square and Purdy's Wharf were counted for the first time and, although they are significant supplementary routes, do not appear to greatly influence the number of pedestrians on the streets beneath them.

- Spring Garden Road is the busiest pedestrian street in the study area and its numbers have continued to increase from previous studies. Streets feeding into Spring Garden Road have even more consistent large increases than Spring Garden itself.

- Gottingen Street, which is on the edge of the study area, continued to have lower volumes than other streets. It remains largely a local commercial area, separate from the remainder of the downtown.

- New residential projects raised counts modestly in the southern part of the downtown.

## BACKGROUND

The 1987 Pedestrian Study for downtown Halifax was undertaken to assess pedestrian flow levels and patterns in the Central Business District and the adjacent commercial areas of Spring Garden Road and Gottingen Street (see Map 1). The study is, in part, a follow-up to two previous surveys carried out in 1978 and 1981. It includes all sites that were surveyed in the previous studies plus new sites of interest in areas adjacent to major pedestrian routes and pedways from Scotia Square and Purdy's Wharf.

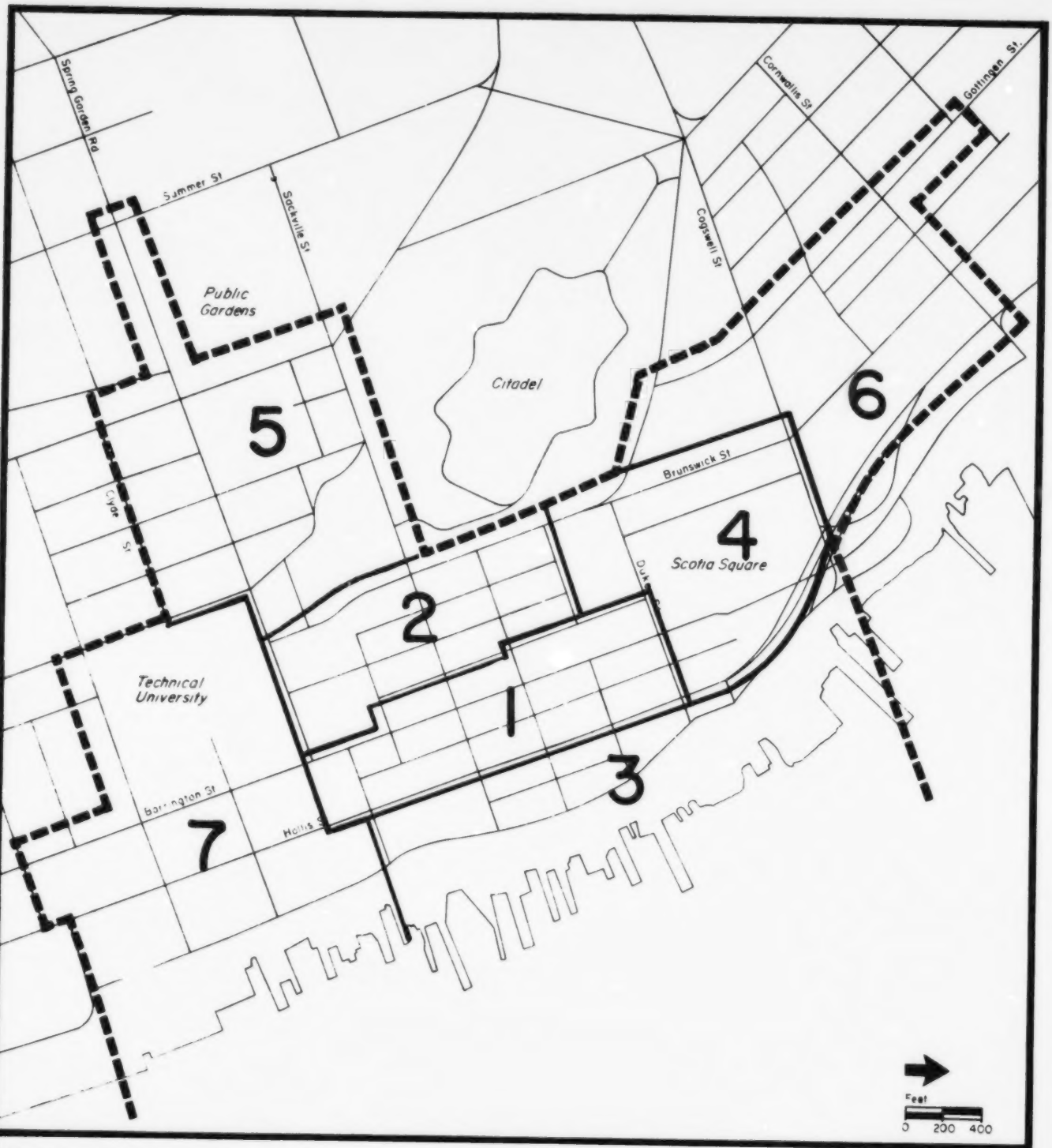
The primary objective of the survey was to determine an average hourly pedestrian count for each mid-block location in the study area for comparison to the two previous studies. Peak hour counts were also recorded for this study, unlike its two predecessors, and were compared to average volumes. Peak hour counts show the level of use on each sidewalk during its period of maximum activity and can be helpful in determining the adequacy of pedestrian facilities.

As with the previous studies, counting was done in the summer months. The methodology, which is described in detail in the Technical Appendix, was modified somewhat to take better advantage of improved computer processing facilities and to increase the amount of information that the counts yielded.

## DAY-LONG COUNTS

The first step of the study was to conduct day-long counts at high volume intersections in the study area. As Map 1 shows, the study area was divided into seven subareas with distinct pedestrian characteristics. The intersection in each of these subareas with the highest count in the 1981 survey was selected to be counted for one whole working day, from 8:00 a.m. to 6:00 p.m. The intersection of Duke and Barrington, which had the highest volume of all intersections in the downtown was counted for this same period over an entire work week. The locations of these intersections are shown on Map 2.

The purpose of these day-long counting sessions was to develop profiles of daily pedestrian patterns. Each daily profile indicates the proportion of pedestrians that can be expected within a specific hour and at 5-minute intervals within each hour. From the profiles for each subarea factors were developed and applied using the methodology described in the Technical Appendix.




Downtown Pedestrian Study

Map I

# STUDY AREA AND SUB-AREAS

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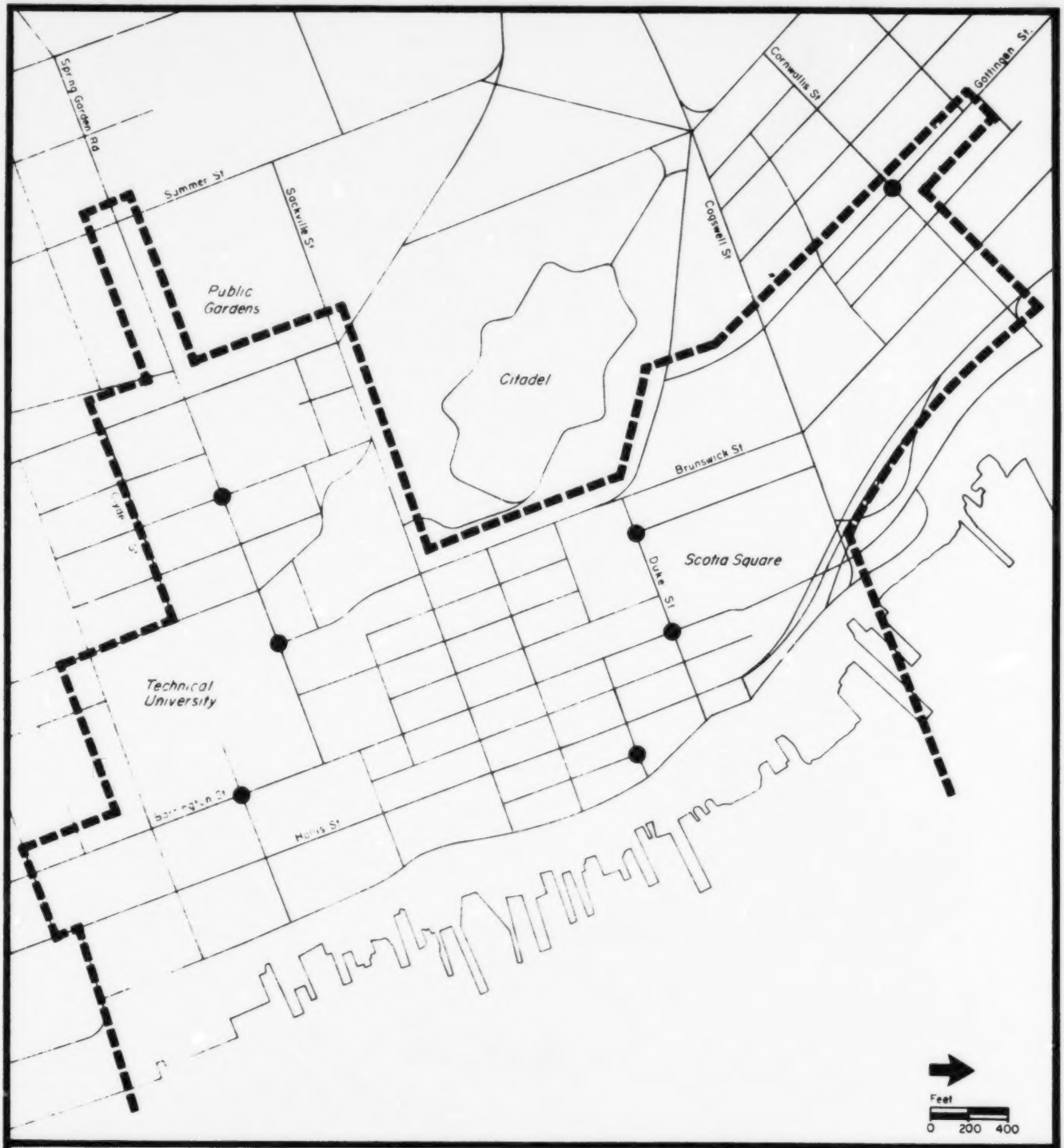


Downtown Pedestrian Study

Map 2

# DAY LONG COUNTS 1987

● Intersections Used

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City of Halifax

The day-long counts are, however, very interesting in themselves. From them it is possible to determine fluctuations in pedestrian flows during the working day, compare these fluctuations between the subareas, and infer the overall pattern of pedestrian traffic prior to analyzing the mid-block counts. The week-long survey Duke and Barrington also provides a picture of day-to-day variations over the course of the work week.

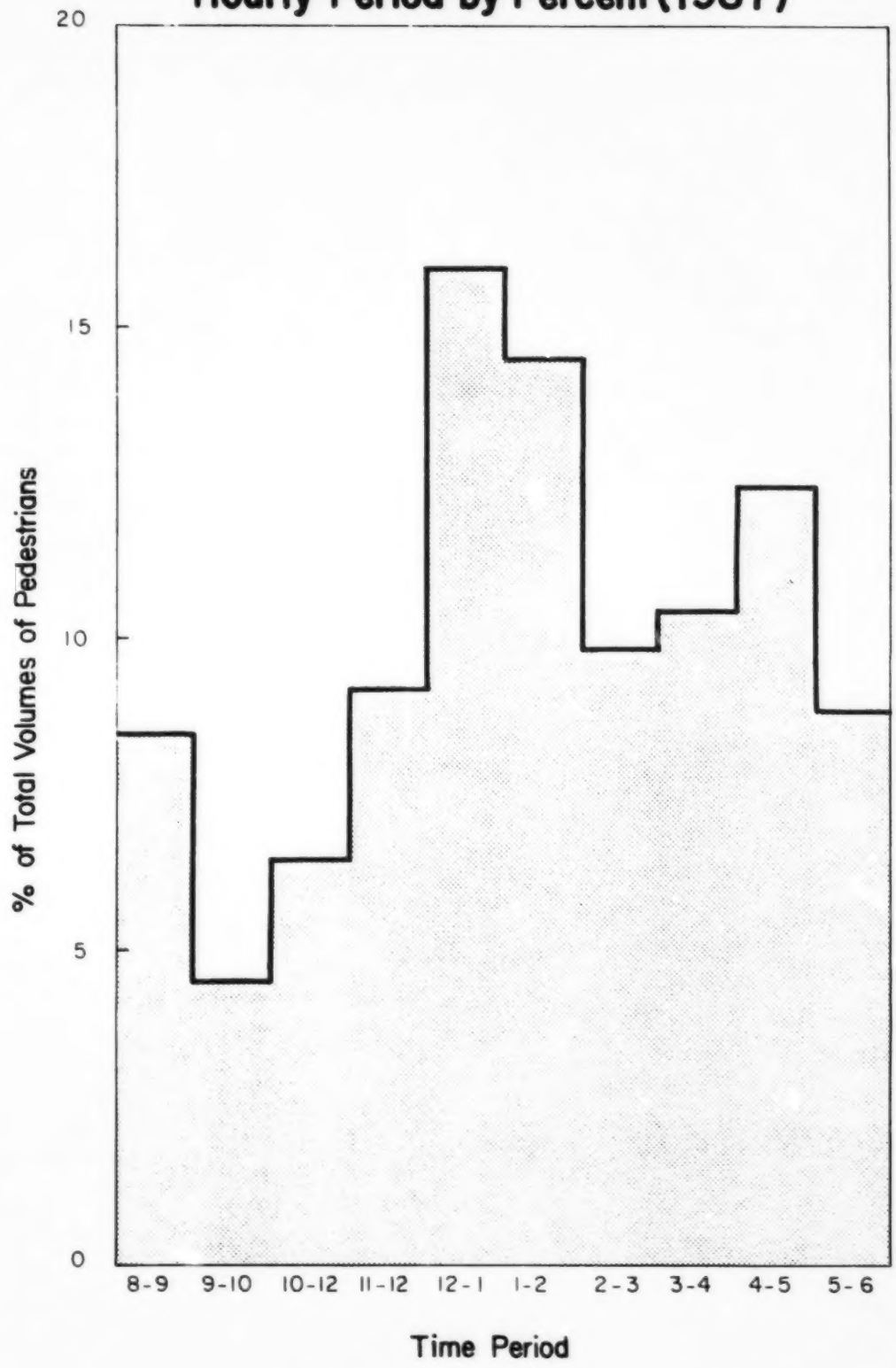
The daily pedestrian pattern is portrayed on Figure 1. It shows three distinct peaks associated with the morning period when workers arrive in the downtown, the lunch hour or hours, and the late afternoon when workers leave their employment either for other locations in the downtown or to go home. Pedestrian counts drop off sharply after the hour from 8 to 9:00 a.m. and then climb gradually toward lunch time. The first of the lunch crowd appear to be on the streets between 11 a.m. and 12:00 noon, but the lunch period is underway in earnest between noon and 1:00 p.m., the peak period of the day, and from 1:00 to 2:00 p.m. From the end of the lunch period, afternoon traffic sustains a considerably higher level than the morning, probably because it is augmented by shoppers and tourists, and rises moderately to the hour between 4:00 and 5:00 p.m. when most downtown employees leave for home.

Day-to-day variations in this pattern do not appear to be great based on the week-long survey of the intersection of Duke and Barrington Streets The major variation in that location appears at the end of the week when the proportion of pedestrians in the morning rises slightly and the percentage in the afternoon falls. We strongly suspect that this modest fluctuation indicates that downtown employees stay in the area on Thursdays and Fridays to take advantage of the nightlife. The explanation for the discrepancy at Duke and Barrington is that it is normally on the path from a variety of downtown workplaces to bus stops around Scotia Square and the Ferry Terminal, and the Ferry Terminal itself. Late in the week a portion of this traffic is drawn to restaurants and drinking establishments elsewhere in the downtown.

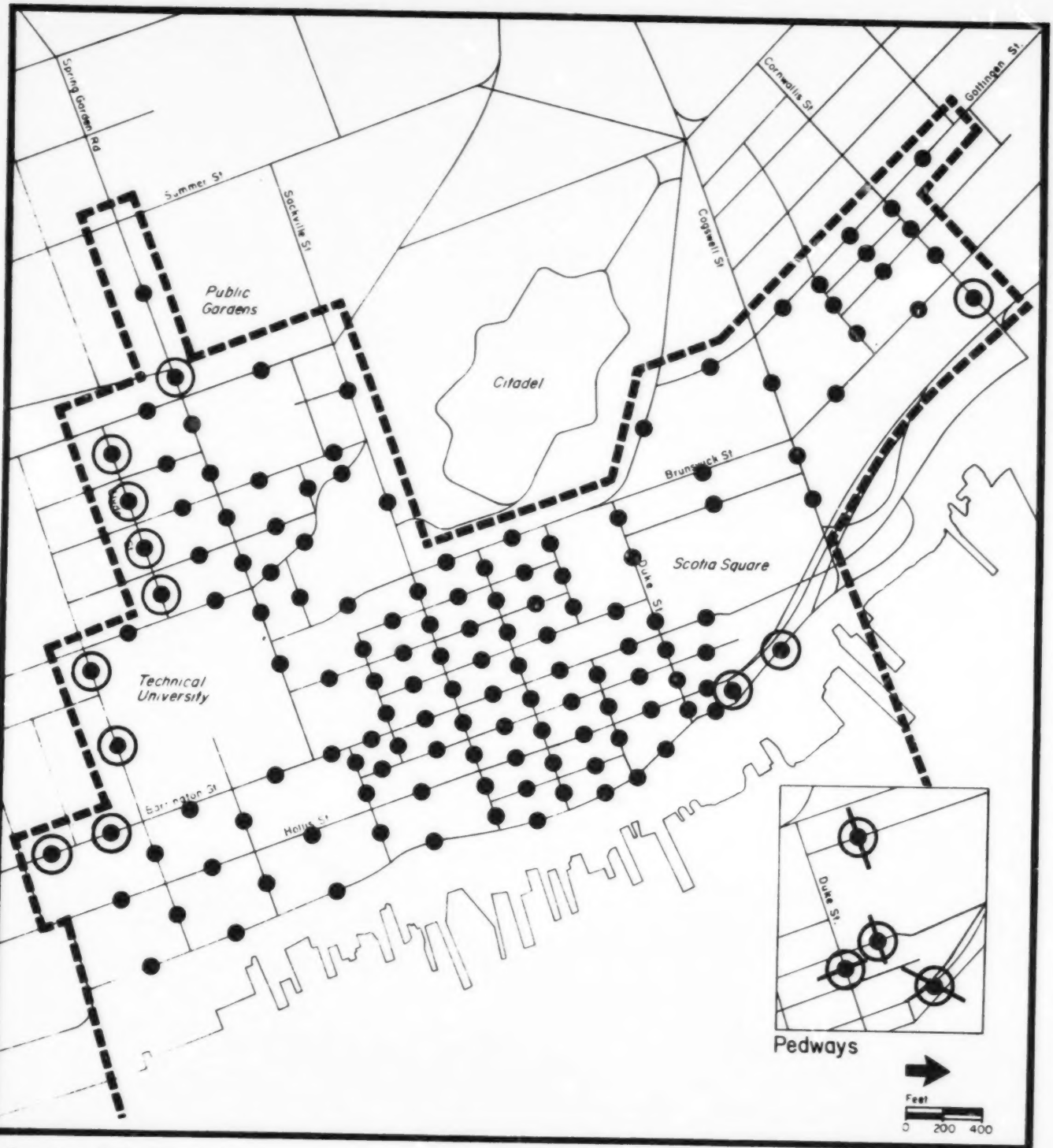
## MID-BLOCK COUNTS

As with the previous pedestrian studies, the major effort of the 1987 study was to count pedestrians at mid-block locations. The locations counted are shown on Map 3. Eleven on-street locations along the edge of the study area were added to the stations counted in 1981 as well as four pedways connecting Scotia Square, Barrington Place, Purdy's Wharf, and the Bank of Commerce Building.

## Figure 1: Total Volumes of Pedestrians per Hourly Period by Percent (1987)




Source: City of Halifax Development and Planning Dept., Pedestrian Study, 1987




Downtown Pedestrian Study

Map 3

# COUNTING STATIONS 1987

- Locations
- New Locations

Development and Planning Dept. City of Halifax

Because of limited resources and after some testing to determine that counts would be reliable, it was decided to shorten the counting time from the one hour period used in 1978 and 1981 to 15 minutes. Five minutes were allowed to move from one location to the next so three counts could be completed in each hour.

In contrast to earlier studies, the order of counting stations for 1987 was generated at random by a computer program, since a genuinely random sample is statistically more reliable. However, it occasionally made it necessary to get one end of the study area to the other within five minutes, which our surveyors were able to accomplish by using bicycles.

A count was done in each of five time slots identified from the daily volume profile shown in Figure 1, above, at each location shown on Map 3, giving a total of five results for each mid-block location. The time slots used to cover the cycles of the day were as follows:

| | |
|---|---|
| 8:00 a.m. to 10:00 a.m. | early morning |
| 10:00 a.m. to 12:00 noon | mid-morning |
| 12:00 noon to 2:00 p.m. | lunch time peak |
| 2:00 p.m. to 4:00 p.m. | mid-afternoon |
| 4:00 p.m. to 6:00 p.m. | late afternoon |

This too is a modification from the earlier studies, which did five one hour counts for blocks considered to be high volume and just two for lower volume locations. The revised approach is considered better because it avoids making assumptions about which blocks are high volume and which are not and because low volume locations were counted more often than before.

In all, 142 mid-block locations and pedways were counted between the beginning of June and mid-July. Counts were not collected on holidays, weekends, or rainy days. Counts that were missed because of inclement weather were picked up in the same time slot on the same weekday at the earliest following opportunity. In other words, a missed count scheduled for Tuesday between nine and ten was done on a subsequent Tuesday between nine and ten in the last week and a half of surveying. Fortunately, good weather through the counting period helped to complete the survey promptly without much deviation from the original computer generated schedule.

The factors derived from the day-long surveys were subsequently applied to the mid-block counts to develop daily volumes. The daily volumes were then averaged and divided by ten (the number of hours in the survey period) to obtain the average hourly counts portrayed on the maps accompanying the following section. The procedure is described in more detail in the Technical Appendix.

## ANALYSIS

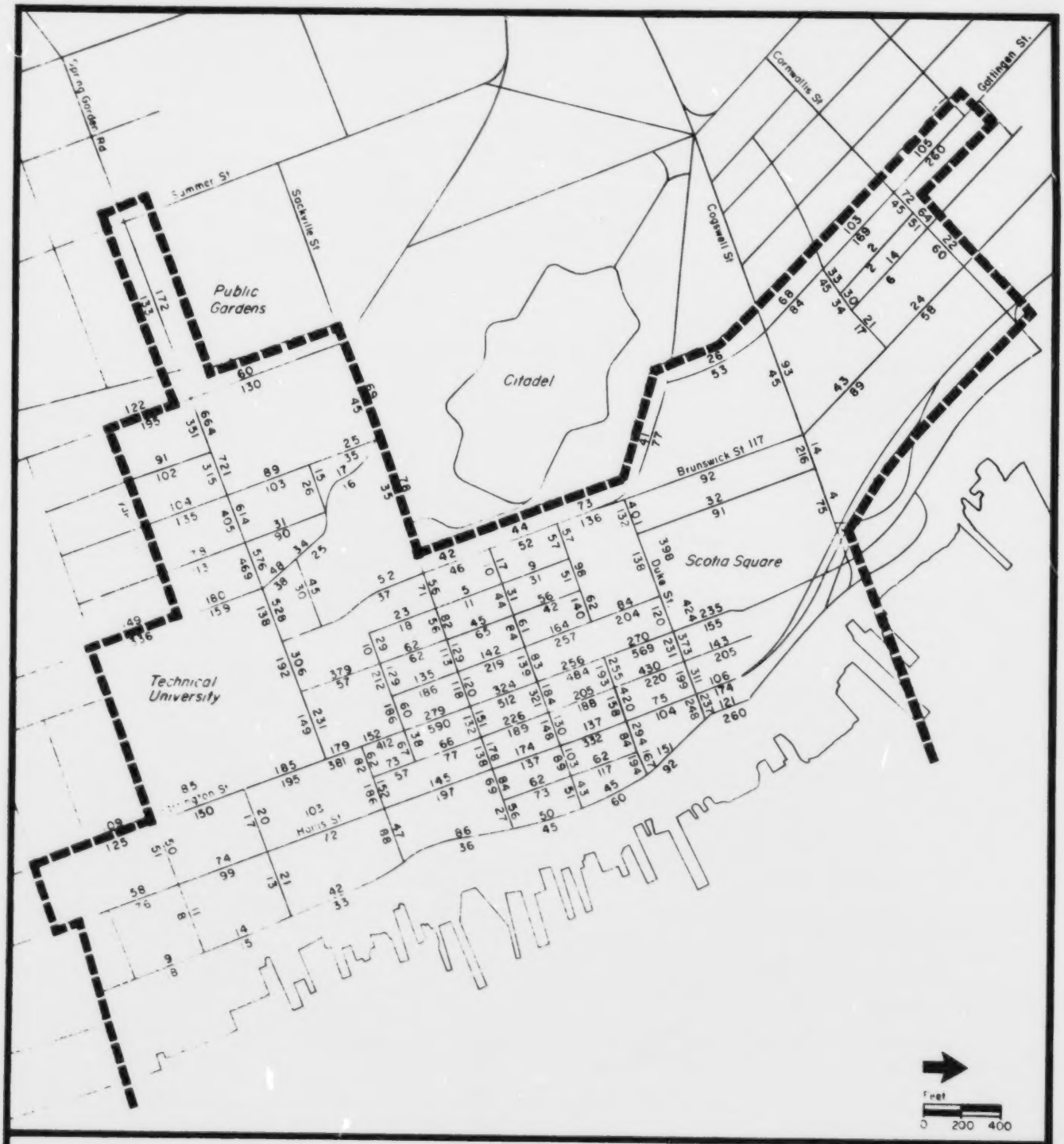
Although the methodology for the 1987 Pedestrian Study was changed somewhat from its 1981 counterpart, the results obtained were consistent. Again, there was an overall increase in downtown pedestrian traffic and the major pedestrian arteries of 1981 continue to prevail. For each of the downtown subareas summary observations are similar to those found in the 1981 report.

The 1981 study found an increase of 5,000 persons per hour in total pedestrians counted at locations included in both the 1978 and 1981 studies. The increase from roughly 25,000 to 30,000 was 6.27 percent annually over the three years. The increase from 1981 to 1987 was considerably more moderate at 2.65 percent per year or from 35,000 to 41,000 pedestrians in six years. It is based on a comparison of stations used in both 1981 and 1987 (i.e., the locations shown on Map 3, excluding the 15 new stations). Counts at stations surveyed in 1978, 1981, and 1987 increased from 30,000 to 34,000 in the 1981 to 1987 period or 2.11 percent annually--slightly less than the overall increase.

### Major Pedestrian Routes

The major origin points for downtown pedestrians are areas where people disembark from various types of vehicles that carry them into the downtown area. The most notable areas of this type are the Spring Garden Road parking lots; Scotia Square; and areas of the waterfront where the Halifax-Dartmouth ferry lands, a number of bus routes converge, and there is a number of parking lots. These are also locations for major concentrations of buildings that absorb pedestrian traffic early in the day and generate it for the remainder of the work period.

Downtown Halifax is also, of course, built on the side of a hill and the choice of pedestrian routes is influenced by street grade. All of the routes that we would categorize as major downtown arteries based on the data collected have a shallower incline than the obvious alternate routes (Table 1). These routes also tend to have more and larger buildings, with a higher proportion of retail uses, but that may well be an historic consequence of their more comfortable topography. Both the 1981 counts on Map 4 and 1987 counts on Map 5 show this influence as north-south streets that traverse the hill have consistently higher counts than east-west routes that go up and down the hill, with the exception of Spring Garden Road, which has easily the gentlest incline of the east-west streets.




Downtown Pedestrian Study

Map 4

# AVERAGE HOURLY COUNTS 1981

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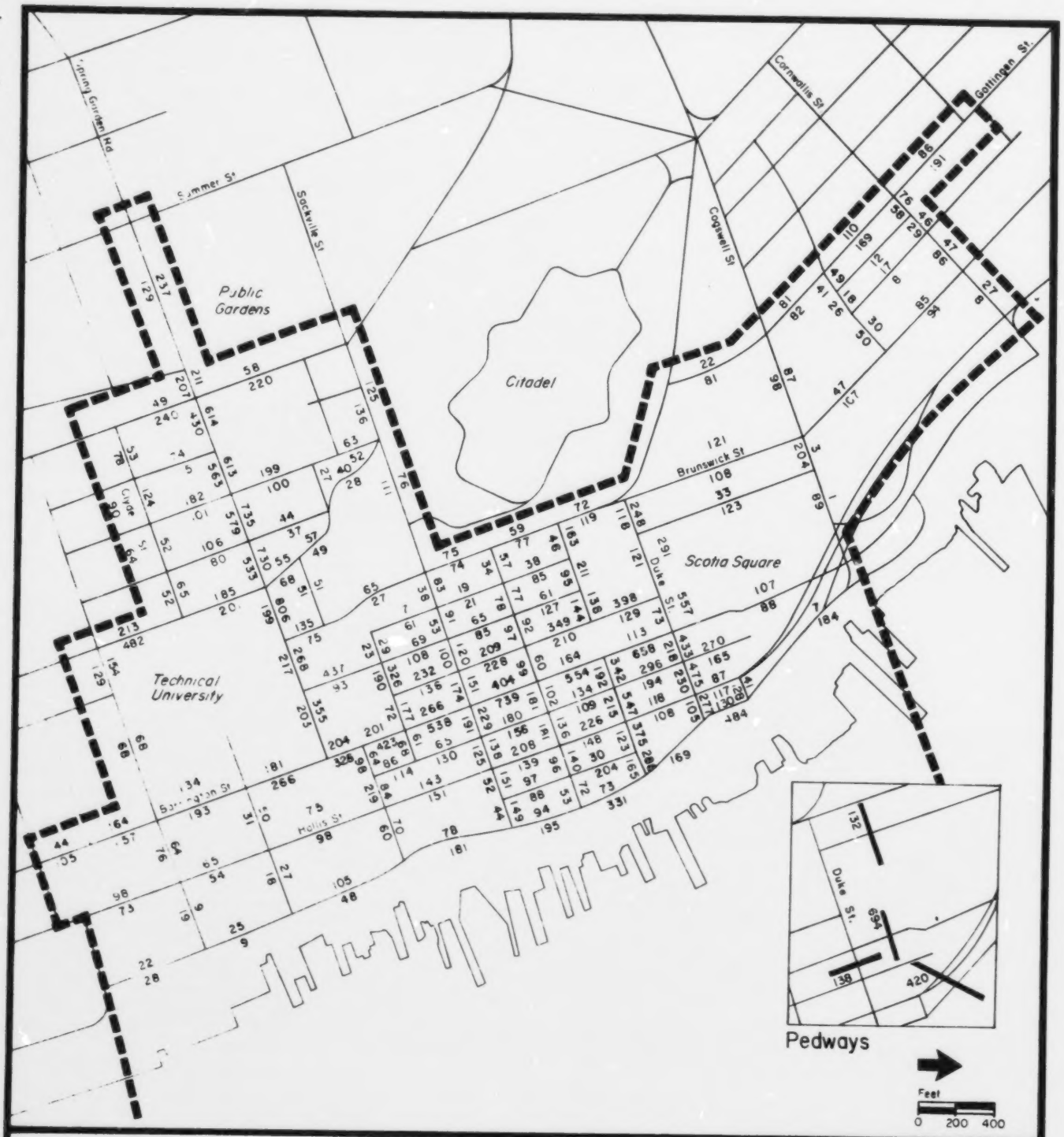



Downtown Pedestrian Study

Map 5

# AVERAGE HOURLY COUNTS 1987

Development and Planning Dept. City of Halifax

TABLE 1: Mid-blocks with Largest Pedestrian Volumes

| | Street | Between Streets | Volume Pedestrians Per Hour | Peak hour counts |
|---|---|---|---|---|
| 1 | Spring Garden | Dresden Row/Birmingham | 1313 | 2469 |
| 2 | Spring Garden | Birmingham/Queen | 1264 | 2375 |
| 3 | Spring Garden | Brenton/Dresden Row | 1176 | 2212 |
| 4 | Barrington | Sackville/Prince | 1142 | 1827 |
| 5 | Spring Garden | South Park/Brenton | 1043 | 1961 |
| 6 | Spring Garden | Queen/Brunswick | 1005 | 1889 |
| 7 | Barrington | Blowers/Sackville | 804 | 1287 |
| 8 | Barrington | George/Duke | 771 | 1234 |
| 9 | George | Granville/Hollis | 762 | 1220 |
| 10 | Barrington | Prince/George | 719 | 1150 |

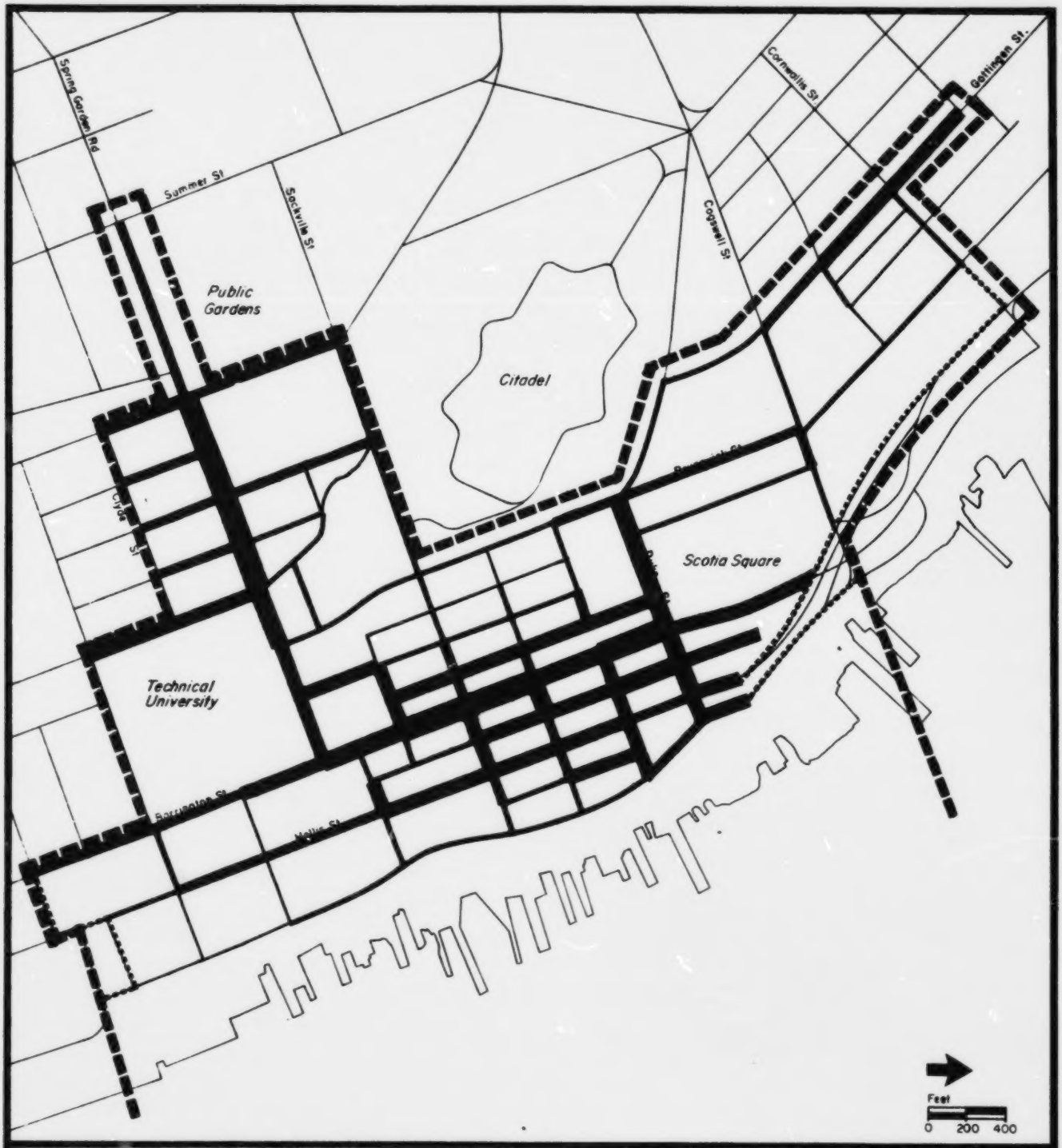
Comparison of 1981 and 1987 data indicates that the main pedestrian routes continue to be Spring Garden Road and Barrington Street, although there are some interesting changes when individual blocks are examined. Both streets have relatively shallow grades and with a number of major tributaries discussed below connect the major concentrations of buildings and disembarkation areas noted above. Inspection of changes indicates locations of attractive new developments and of construction sites.

For example, counts on the north side of Spring Garden Road were about the same as in 1981; however, south side counts increased substantially. The opening of Spring Garden Place has undoubtedly drawn pedestrians to the south side, while the on-going construction of Park Place on the corner of Spring Garden and Dresden Row has been a negative factor on the north side, which previously showed substantially higher counts that the 1981 report attributed to its superior exposure to sunlight.

On Barrington Street increases have been moderate and a number of blocks declined. There has been less significant new construction but renovations and roadwork were underway at the time of surveying. This is particularly noticeable in front of the Grand Parade where renovation of City Hall requires placing a dumpster on the sidewalk of the block between Duke Street and the Parade entrance. Those counts should rebound with the end of renovations.

Other major pedestrian routes can be identified in relation to these two arteries. The north side of Duke Street has substantial pedestrian volumes because it borders Scotia Square and intersects with Barrington. Argyle Street, which is part of the shortest route between Scotia Square and Spring Garden Road, has continued to increase its importance as a substitute for Barrington for pedestrians travelling north-south. Because Scotia Square is on a heavily travelled path to Historic Properties on the waterfront, Argyle Street is a key segment of the most important tourist path in the downtown. The many attractive restaurants, pubs, and specialty stores that have been added on Argyle Street in the past decade increase its interest for tourists and shoppers moving between Spring Garden Road, Scotia Square, and Historic Properties.

A further important change on Argyle between 1981 and 1987 is the construction of the World Trade Centre. In 1981 the building foundation was being excavated, which caused a very low count on the block between Duke and George where it is located. It is now a major pedestrian generator and attractor, and, along with some additional bars and stores also on the west side of Argyle, has substantially increased traffic on that side of the street. The east side of Argyle, on the other hand, has




Downtown Pedestrian Study

Map 6

# COMBINED COUNTS 1981 (Total of average hourly counts for both sides of the street)

Class Intervals

| | | | |
|---|---|---|---|
| ——— | 1 - 50 | ■■■ | 501 - 750 |
| ——— | 51 - 150 | ■■■ | 751 + |
| ■■■ | 151 - 250 | ..... | No Counts |
| ■■■ | 251 - 500 | | |

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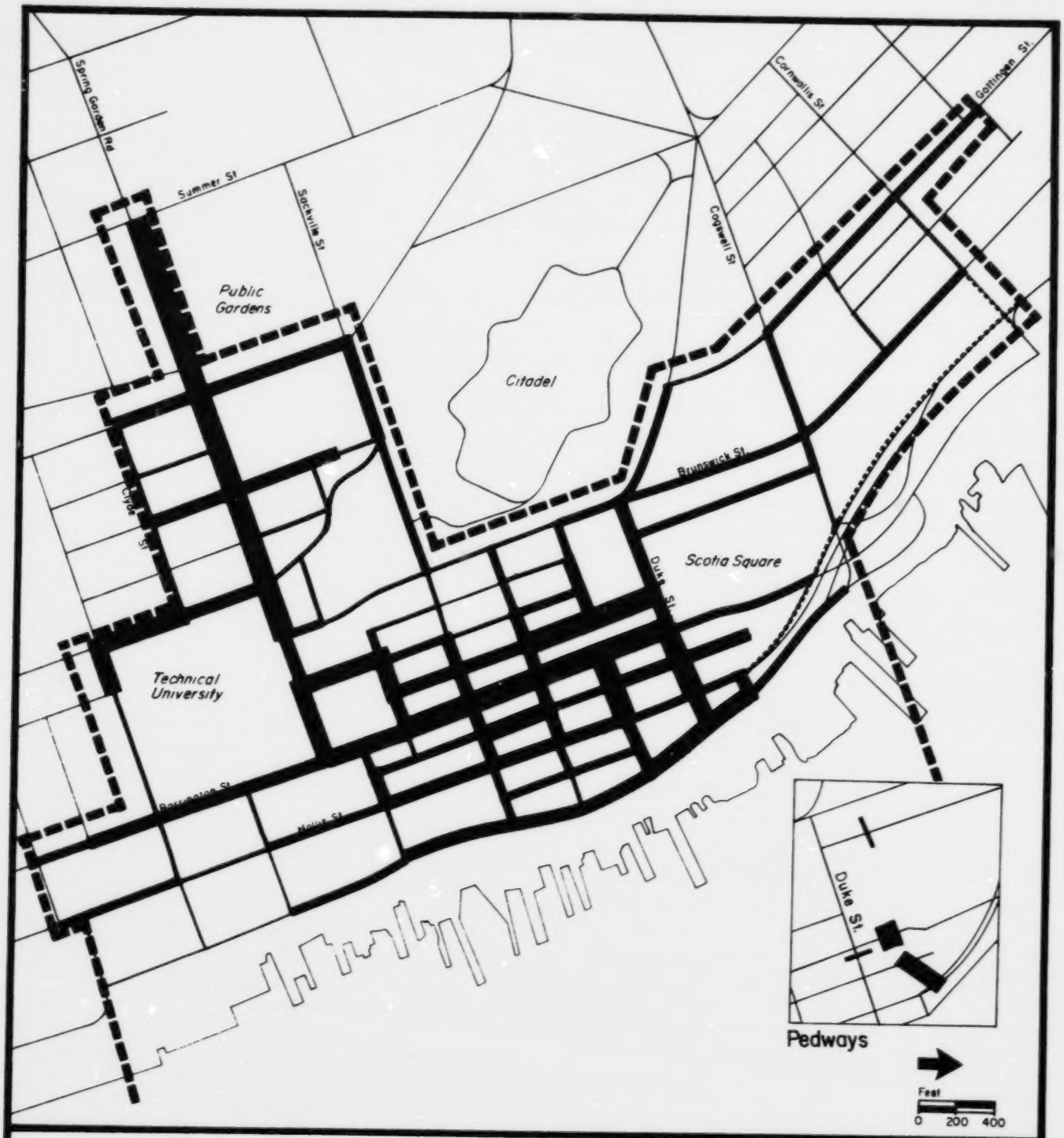


Downtown Pedestrian Study

Map 7

# COMBINED COUNTS 1987 (Total of average hourly counts for both sides of the street)

Class Intervals

| | |
|---|---|
| 1 - 50 | 501 - 750 |
| 51 - 150 | 751 + |
| 151 - 250 | No Counts |
| 251 - 500 | |

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declined somewhat. In the vicinity of the Grand Parade, City Hall renovations have had the same effect as on Barrington Street, but declines on the two southern blocks are more difficult to explain, considering that several new restaurants have opened and Cleve's Sporting Goods has expanded since 1981. The most likely contributing factor is the elimination of the small restaurant behind the City Club between Sackville and Blowers and the demolition of the back of the club, which has left a large unattractive gap in that portion of the streetscape.

Further major arteries are Duke from Historic Properties to Scotia Square and George from the Ferry Terminal to Barrington Street. The lower portion of Duke, as previously mentioned, carries traffic from Historic Properties to Scotia Square, while George is the site of the Provincial Legislature and major buildings belonging to the Bank of Montreal, the Royal Bank, Central Trust, and Toronto-Dominion. George is also the key route to and from the Halifax-Dartmouth Ferry Terminal. Both have a shallower slope, than east-west streets to the south. There have been increases on both streets, with very substantial growth on George.

**Subarea Patterns**

The seven subareas defined on Map 1 display distinct patterns of pedestrian flows and different levels of growth. Each subarea functions as part of the overall downtown pedestrian area with the major arteries as described above. Some areas encompass the major routes, while others are served by secondary feeders, and still others remain relatively independent of the network previously described.

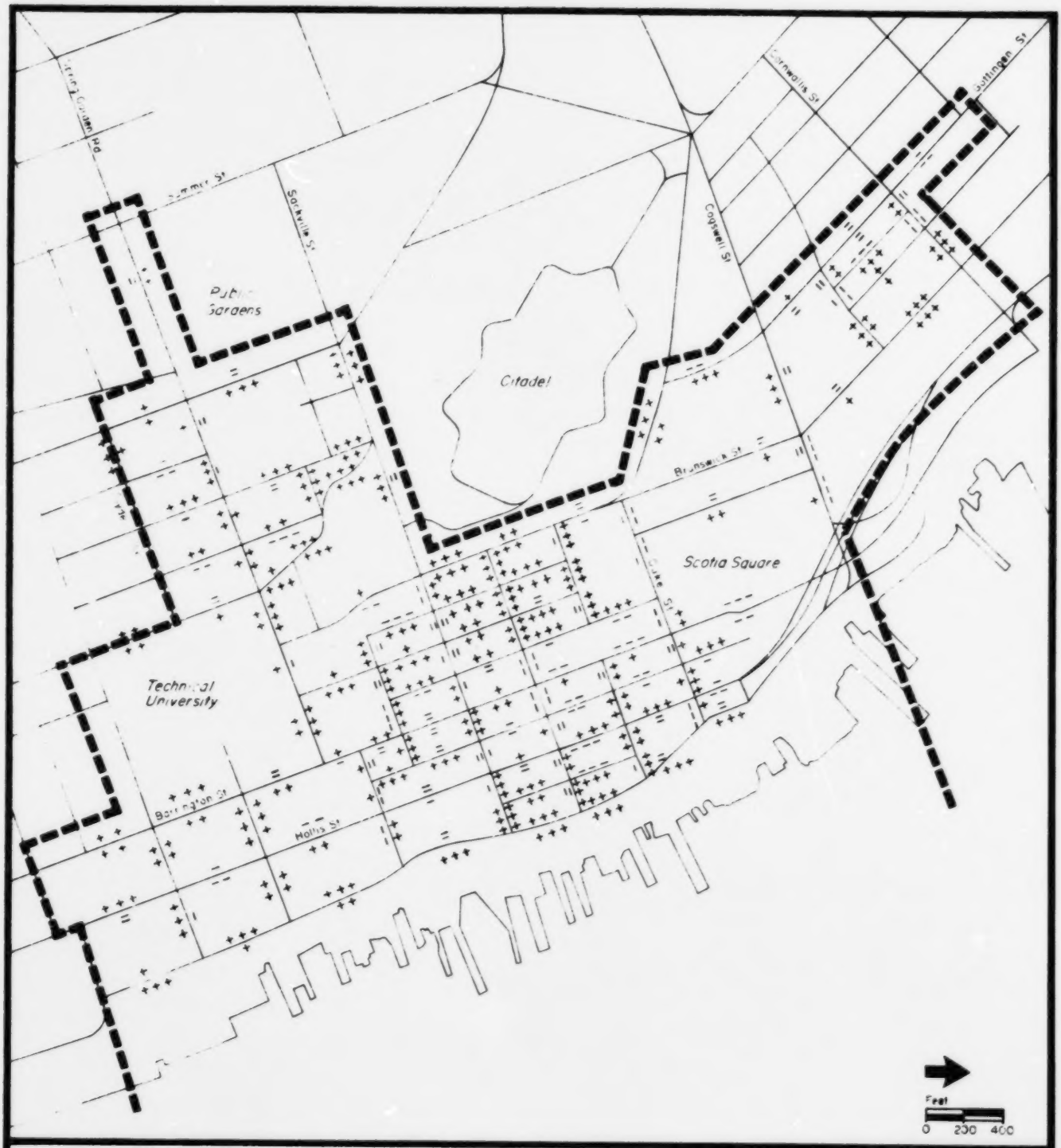
Areas 1 and 5 can be considered the heart of the downtown pedestrian area, as they cover the major blocks of Barrington Street and Spring Garden Road. In all of the surveys undertaken by the City they have exhibited the highest pedestrian flows. Area 2 is primarily a bridge between 1 and 5, although it contains some north-south routes that substitute for Barrington Street. Areas 4 and 7 play a similar role to Area 2, carrying pedestrians from the north and south ends respectively into the two core subareas. Area 6, around Gottingen Street, on the other hand, shows the lowest counts of all the subareas owing to the relatively small number of major land uses and its general separation from the remainder of the downtown. The breakdown of changes for mid-blocks by subareas is shown on Table 2.

Area 1 (Core of Barrington Street and tributary streets): Area 1 showed a slightly higher proportion of streets with decreased pedestrian flows relative to other parts of the study area. Four or five blocks on Barrington Street showed an overall

TABLE 2: Number of Mid-block Locations Increasing or Decreasing

| | Area | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Percentage | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Total | Percent of Total |
| +51% | 2 | 10 | 5 | 0 | 6 | 3 | 3 | 29 | 21.64 |
| 26% to 50% | 8 | 7 | 6 | 1 | 6 | 4 | 8 | 40 | 29.99 |
| 11% to 25% | 6 | 3 | 2 | 2 | 6 | 4 | 1 | 24 | 17.91 |
| 0% to 10% | 3 | 2 | 0 | 1 | 1 | 2 | 0 | 9 | 6.72 |
| Total increasing | 19 | 22 | 13 | 4 | 19 | 13 | 12 | 102 | 76.12 |
| 0% to -10% | 5 | 3 | 1 | 2 | 1 | 0 | 1 | 13 | 9.70 |
| -11% to -25% | 5 | 0 | 1 | 1 | 1 | 1 | 0 | 9 | 6.72 |
| -26% to -50% | 3 | 0 | 0 | 3 | 1 | 2 | 1 | 10 | 7.46 |
| -50% + % | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| Total decreasing | 13 | 3 | 2 | 6 | 3 | 3 | 2 | 32 | 25.37 |
| Total | 42 | 25 | 15 | 10 | 21 | 16 | 14 | 134 | 100.00 |

See Map 8 also




Downtown Pedestrian Study

Map 8

# PERCENT CHANGE IN AVERAGE HOURLY COUNTS 1981-87

+ + + 51% And Over Increase
+ + 26-50% Increase
+ 11-25% Increase
= 10% Change or Less
− 11-25% Decrease
− − 26-50% Decrease
− − − 51% And Over Decrease

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decrease of between three and eight percent. On Granville Street the three blocks that lie within Area 1 showed declines of between 20 to 40 percent. Even the side of the two blocks of Argyle Street within Area 1 (the east side) fell by more than 10 percent, although Argyle Street has generally increased its importance.

Area 2 (Lower Spring Garden, Blowers, and Argyle): Area 2 in the southwest corner of the study area, which is the bridge between Area 1 and the Spring Garden Road area (Area 5), showed the greatest proportion of increases from 1981. The streets comprising the connection between Spring Garden and Blowers, Blowers itself, and Argyle--exhibit high volumes that have generally risen substantially. Other blocks in the subarea have also increased their numbers of pedestrians but continue to show low counts. The 1987 survey showed decreases on the blocks of Sackville, Brunswick, and Market Streets adjacent to Cambridge Place, which was approaching the end of construction during the survey period. The end of construction should, however, raise counts on these blocks and generally in the vicinity of the project.

Area 3 (North and Central Waterfront): Although Area 2 had the highest proportion of blocks with increases, the most dramatic percentage increases were observed in Area 3. A number of increases in excess of 100 percent and three on Lower Water Street in excess of 200 percent indicate a marked change. Improvements in the area such as a recent sidewalk modification by the Halifax Waterfront Development Corporation, and construction of Purdy's Wharf, the Sheraton Hotel, and the Central Trust Tower have undoubtedly caused these changes. With tourist attractions like the Maritime Museum, the harbourfront boardwalk, the sidewalk cafes, and Historic Properties this has become a more and more attractive area for pedestrians.

Area 4 (Scotia Square and vicinity): In Area 4, which surrounds Scotia Square, pedestrian volumes fell from the 1981 counts on six of the ten mid-blocks. The combined mid-block count has, in fact, dropped from an average of 2,937 people per hour to 2,481 people per hour. Even the intersection of Duke and Barrington Streets experienced a drop of 15 percent, although it remains the busiest intersection in the downtown.

Counts of the four pedways in Area 4 were done for the first time in 1987. These indoor routes offer an alternative to the outdoor sidewalks in the subarea; however, it is unlikely that they have contributed significantly to the falling counts. Only the long pedway joining Purdy's Wharf to Barrington Place was completed since 1981 and it is largely a substitute for the blocks of Duke Street east of Barrington, which are in Area 1 and increased their counts. The pedway between the Bank of Commerce building and Barrington Place is the only one that runs

north to south and it carries only 138 pedestrians in an average hour in both directions, which is similar to a minor downtown street and small relative to the 2,195 pedestrians that pass through the Duke and Barrington intersection every hour.

The most important pedway connects Scotia Square to Barrington Place and carries nearly 700 persons in both directions each hour, which is similar to a more lightly travelled block at the end of one of the major downtown pedestrian arteries. The final pedway joins Scotia Square to Brunswick Street across Market Street and showed counts characteristic of a minor street. Overall the pedway system appears to be a supplement to the traditional sidewalk system but, in summertime at least, does not provide substantial competition.

Area 5 (Spring Garden Road commercial area): Area 5, the Spring Garden Road area, continues to increase its counts. The long-established retail stores on the street have held their popularity and the completion of Spring Garden Place has added to the attraction of the street. Although Spring Garden Place mixed with the on-going construction of the Park Lane building have shifted pedestrians from the north side of Spring Garden Road, the basic characteristics of the street that were acknowledged to contribute to its attraction to pedestrians in 1981--its continuous retail frontage, greater width, relative levelness, and exposure to sunlight--are still the major sources of its success. When the Park Lane is completed we would expect very substantial gains on the north side of Spring Garden Road both because the north side is more exposed to sun and because the new building with its retail and office uses should be a major attraction.

The various secondary streets in the area--Brenton, Dresden Row, Birmingham, and Queen--had more consistent large increases on blocks north of Spring Garden than Spring Garden itself. The rehabilitation of the Courtyard on Dresden between Artillery Place and Sackville Street is the only major change on those streets but the overall small-scale charm of the area seems to work in its favour. To the south of Spring Garden increases were balanced by decreases but that may well change when Spring Garden Place is extended along Dresden Row and provides a strong motive for pedestrians to leave Spring Garden in that direction.

Area 6 (Gottingen Street Commercial Area): The Gottingen Street area, Area 6, showed a marked percentage increase on a number of streets. The actual volume increase, however, was small. The heaviest volumes, which average about 280 people per hour, continue to be found along Gottingen Street itself. There has been no substantial construction on Gottingen Street with the exception of the Vimy Arms apartments for veterans; however, the

neighbourhoods adjacent to the study area have been substantially upgraded. On the whole, it does not appear that these changes have had a significant effect on pedestrian traffic.

Area 7 (Southern CBD and Waterfront): Finally, Area 7, in the southeast corner of the study area has also shown a general but moderate increase. The completion of the Brewery is an important factor in this area but it is not sufficient by itself to create the level of traffic associated with more heavily commercial parts of the downtown. The Renaissance South condominium on the corner of Morris and Barrington Streets raised counts on the blocks next to it, while the construction of Waterfront Place on Lower Water Street between Morris and Bishop Streets slightly lowered counts in its vicinity. As with the Gottingen Street area, residential construction of this type has some influence on pedestrian traffic but is not sufficient to move secondary downtown streets up to the level of the major pedestrian arteries.

## Peak Hour Counts

Peak hour counts were calculated for all locations. They provide a measure of the maximum use of each block and reflect some of the distinctive features of the subareas previously discussed. This information was not collected for the previous studies.

Areas 1, 2, 5, and 7 exhibit a daily pattern similar to the overall profile shown on Figure 1, with the peak hour occuring between 12:00 noon and 1:00 p.m. In Area 6, which is primarily influenced by the neighbourhood around Gottingen Street, the peak was between 1:00 and 2:00 p.m., while Areas 3 and 4 showed a 4:00 p.m. to 5:00 p.m. peak. The late peak in Area 3, which includes the lower portion of George Street, is definitely attributable to workers going to the Ferry Terminal at the foot of the street. Employees leaving for home are probably also the major influence in Area 4 but an additional factor is likely the tendency of workers in Scotia Square to remain in the complex during the day, which lowers lunchtime flows.

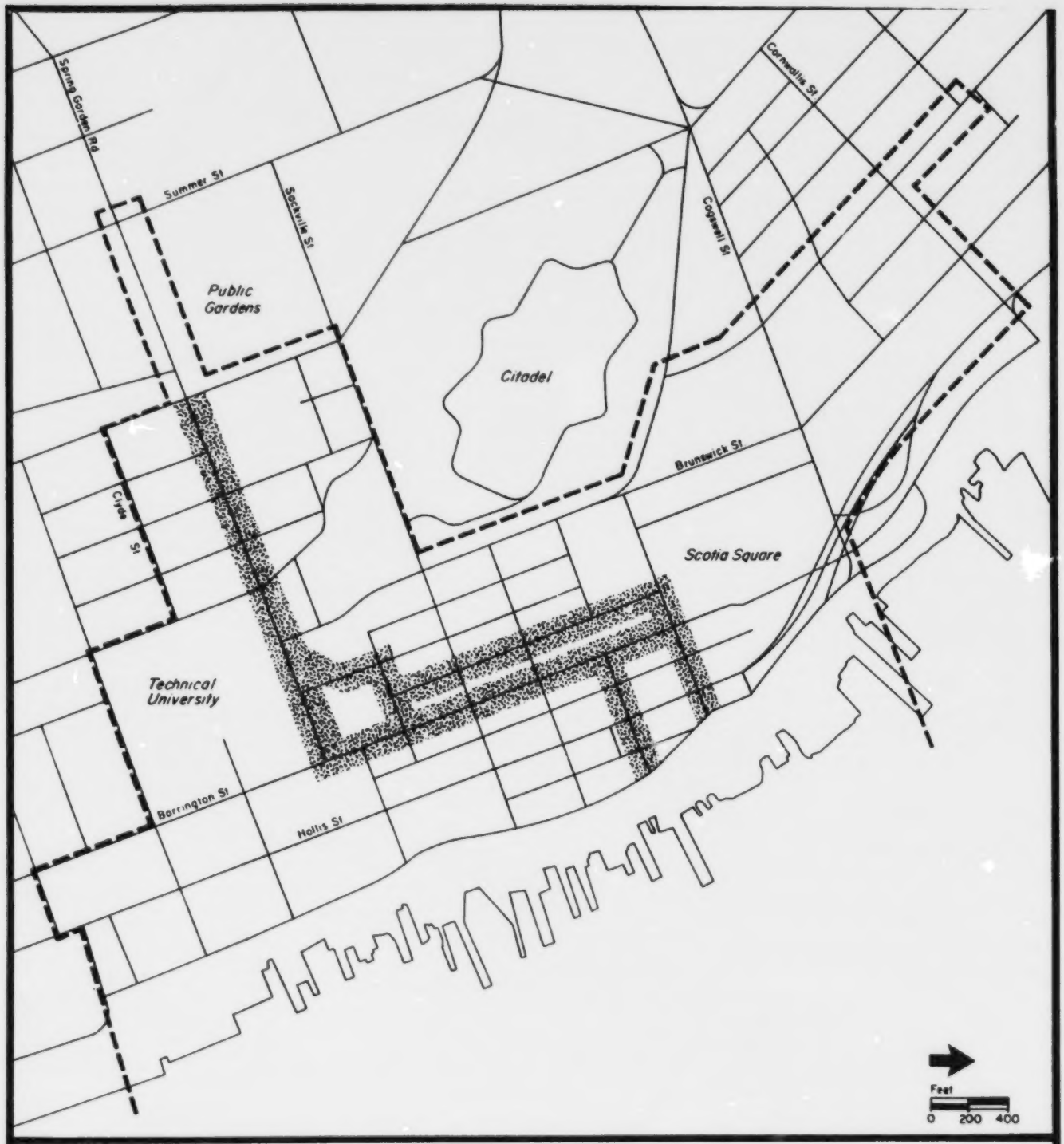
## CONCLUSION

The results of the 1987 Pedestrian Study do not differ greatly from the previous studies of 1978 and 1981. The changes that were discussed above largely result from continuation of trends that were observed in the earlier work. Overall, the number of pedestrians has continued to grow, although at a decelerating pace. The main arteries remain Spring Garden Road and

Barrington Street, although Barrington's dominance is being eroded by Argyle Street. The predominant path through the downtown area involves the two main arteries and Argyle Street with George Street and Duke Street carrying the greatest volumes to the waterfront (Map 9).

The major factor increasing and redirecting pedestrian flows is construction, particularly buildings containing retail uses. While the dirt and noise associated with construction in progress is responsible for most of the more dramatic declines recorded by our counts, important new structures like Purdy's Wharf and the Sheraton Hotel, and Spring Garden Place had evident positive effects. These attractive new buildings both generate pedestrians who are employees within them and draw pedestrians with their stores and offices.

There are slight indications of growth in areas outside the pedestrian core portrayed on Map 9. In percentage terms growth in the south waterfront, at the foot of Citadel Hill, and in the Gottingen Street commercial area has been quite substantial; however, the change in absolute numbers has not been sufficient to move any of the blocks in these areas up to the level of the major downtown arteries. Major commercial infill, for which there is potential in these areas, will be required before that type of increase can take place.




Downtown Pedestrian Study

Map

Major Pedestrian Path

Planning Dept.
City of Halifax

## TECHNICAL APPENDIX

## FACTORING AND COUNTING METHODOLOGY

As explained briefly in the foregoing text, the 1987 Pedestrian Study was carried out in two stages: day-long counts that developed factors for each hour of the day in the various subareas of the downtown and mid-block counts to which the factors were applied to obtain the counts shown on Map 5.

The day-long counts were carried out at intersections in the downtown that had the highest volumes according to the 1982 Pedestrian Study (see Map 2, above). From them a day-long profile of pedestrian volumes was developed for each subarea (Figure 1, above, is a composite of those counts representing the overall profile for the entire downtown) that are necessary to convert mid-block counts into typical daily counts.

The determination of hourly factors is a several step process. An example from Area 3, the central waterfront in the downtown, is illustrative:

1. During the day of counting at the intersection of Bedford Row and George Street the following numbers of pedestrians were observed passing through the intersection during each five minute portion of the hour between 11:00 a.m. and 12:00 noon:

| | 5-MINUTE INTERVAL ENDING | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HR. | :05 | :10 | :15 | :20 | :25 | :30 | :35 | :40 | :45 | :50 | :55 | :00 |
| 11 | 18 | 17 | 47 | 16 | 27 | 29 | 40 | 31 | 89 | 41 | 54 | 53 |

2. To develop factors to be applied to subsequent mid-block counts in Area 3, in which the intersection of Bedford Row and George Street is located, each group of three 5-minute counts was summed and the result was divided by the total number of pedestrians counted between 11:00 a.m. and 12:00 noon. For example, the three counts between 11:00 a.m. and 11:15 a.m. were added as 18 + 17 + 47 = 82 and this result was divided by the total counted in the hour, or 82/462 = .1775. For the data collected at Bedford Row and George Street the results of these calculations were as follows:

| 5-MINUTE INTERVAL | COUNT | 15-MINUTE COUNT | 15-MINUTE SHARE |
|---|---|---|---|
| 11:00-11:05 | 18 | - | - |
| 11:05-11:10 | 17 | - | - |
| 11:10-11:15 | 47 | 82 | .1775 |
| 11:15-11:20 | 16 | 80 | .1732 |
| 11:20-11:25 | 27 | 90 | .1948 |
| 11:25-11:30 | 29 | 72 | .1558 |
| 11:30-11:35 | 40 | 96 | .2078 |
| 11:35-11:40 | 31 | 100 | .2165 |
| 11:40-11:45 | 89 | 160 | .3463 |
| 11:45-11:50 | 41 | 161 | .3485 |
| 11:50-11:55 | 54 | 184 | .3983 |
| 11:55-12:00 | 53 | | |
| | 462 | | |

3. Factors for each 15-minute interval were then calculated as the inverse of the 15-minute percentages. For example, for the interval 11:00 to 11:15 the factor was calculated as 1/.1775 = 5.63 and for 11:05 to 11:20 was 1/.1732 = 5.77. To obtain appropriate precision, these figures were then rounded to the nearest quarter (0.25), so 5.63 became 5.75 and 5.77 also became 5.75. For all 15-minute intervals between 11:00 a.m. and 12:00 noon the following factors were generated:

| 15-MINUTE INTERVAL | 15-MINUTE PROPORTION | FACTOR | ROUNDED FACTOR |
|---|---|---|---|
| 11:00-11:15 | .1775 | 5.63 | 5.75 |
| 11:05-11:20 | .1732 | 5.77 | 5.75 |
| 11:10-11:25 | .1948 | 5.13 | 5.25 |
| 11:15-11:30 | .1558 | 6.42 | 6.50 |
| 11:20-11:35 | .2078 | 4.82 | 4.75 |
| 11:25-11:40 | .2165 | 4.62 | 4.50 |
| 11:30-11:45 | .3463 | 2.88 | 3.00 |
| 11:35-11:50 | .3485 | 2.86 | 2.75 |
| 11:40-11:55 | .3983 | 2.51 | 2.50 |
| 11:45-12:00 | .3203 | 3.12 | 3.00 |

4. Mid-block counts were subsequently done for 15-minute intervals throughout the Downtown. The procedure consisted of counting pedestrians on both sides of the street passing the location where the counter stationed himself. Each 15-minute count obtained was then converted into a one-hour count by application of the factor corresponding to the interval and the area in which it was done. For example, the count for Lower Water Street between Duke and Upper Water Streets, which is in Area 3, done between 11:00 and 11:15 a.m. observed 15 pedestrians passing on the west side and 62 passing on the east side during that period. These

counts were converted to represent the whole hour between 11:00 a.m. and 12:00 noon by multiplying them by the factor for the 11:00 to 11:15 a.m. period, which is 5.75 according to the first row of the preceding table. Thus, the hour counts are 15 x 5.75 = 86.25 or 86, when rounded, and 62 x 5.75 = 356.5 or 356.

5. Four other counts were done for the mid-block on Lower Water between Duke and Upper Water. Along with the previously discussed 11:00 to 11:15 counts, these yielded the following hourly estimates when multiplied by the respective factors for the counting period:

| START | FACTOR | FACTORED WEST SIDE | FACTORED EAST SIDE |
|---|---|---|---|
| 9:20 | 6.25 | 50 | 194 |
| 11:00 | 5.75 | 86 | 356 |
| 13:36 | 4.25 | 187 | 731 |
| 14:41 | 3.50 | 74 | 329 |
| 16:00 | 4.75 | 261 | 694 |

6. To develop the "average hourly counts" shown on Maps 4 and 5 further steps were necessary to convert hourly counts to day-long counts. Counting at the intersection of George Street and Bedford Row provided a day-long or 10-hour profile of pedestrian flows in addition to the one-hour breakdowns already discussed. The breakdown for the hours between 8:00 a.m. and 6:00 p.m. with resulting factors was as follows:

| HOUR BEGINNING | PROPORTION | FACTOR |
|---|---|---|
| 8:00 a.m. | .126 | 7.93 |
| 9:00 a.m. | .041 | 24.39 |
| 10:00 a.m. | .054 | 18.52 |
| 11:00 a.m. | .067 | 14.92 |
| 12:00 noon | .132 | 7.58 |
| 1:00 p.m. | .117 | 8.55 |
| 2:00 p.m. | .086 | 11.63 |
| 3:00 p.m. | .105 | 9.52 |
| 4:00 p.m. | .170 | 5.88 |
| 5:00 p.m. | .100 | 10.00 |

As with the factors to convert 15-minute counts to hourly estimates, the factors are the inverse of the proportions (i.e., for the hour 8:00 a.m. to 9:00 a.m. 1/.126 = 7.93). They were applied to the factored hourly counts as follows:

| HOUR | FACTOR | FACTORED HOUR WEST SIDE | FACTORED HOUR EAST SIDE | FACTORED DAILY WEST SIDE | FACTORED DAILY EAST SIDE |
|---|---|---|---|---|---|
| 9:00 | 24.39 | 50 | 194 | 1219.5 | 4731.7 |
| 11:00 | 14.92 | 86 | 356 | 1283.5 | 5313.4 |
| 1:00 | 8.55 | 187 | 731 | 1598.3 | 6247.9 |
| 2:00 | 11.63 | 74 | 329 | 860.5 | 3825.5 |
| 4:00 | 5.88 | 261 | 694 | 1535.3 | 4082.4 |
| | | | | SUM = 6497.1 | 24200.9 |
| | | | | AVERAGE = 1299.4 | 4840.2 |

The east side average and the west side average were then divided by 10, the number of hours in the counting period, to obtain the numbers shown for the block of Lower Water Street between Duke and Upper Water Streets on Map 5, above, 1299.4/10 = 130 (west side) and 4840.2/10 = 484 (east side).

7. The total for both sides of the street was also apportioned into an overall daily profile using the hour factors developed in step 5. Five daily profiles were thereby created and an average count for each hour was derived to provide a basis for ascertaining the peak hour of pedestrian traffic for each mid-block. Because the calculations required are too numerous, no example is provided here.

The foregoing computations were done for each of the day-long intersection counts and for each mid-block count as applicable. Calculations were done using a computer.